to marine biodiversity. Designated marine protected areas or MPAs that are designated in State waters around the northern Channel Islands are threatened by marine invasive species. Additional mitigation measures are needed to address the threat of marine invasive species. G437-294

- It is unclear whether the Independent Risk Analysis comprehensively evaluates the true nature of future risks to the coastal marine ecosystems of the area from a vessel accident. Management and mitigation options should be described in the BHPB DEIS/DEIR that accommodate uncertainty rather than ignore it, delaying policy until a risk probability distribution is defined with certainty. Additional mitigation measures should be included in the BHPB DEIS/DEIR that address ecosystem-based impacts, such as the potential threats posed by marine invasive species and increased future vessel traffic. G437-295

Threats of Increased Vessel Traffic

The characterization of risks and cumulative impacts to coastal marine ecosystems of the study area described in the BHP Billiton Cabrillo Port LNG Deepwater DEIS/DEIR (hereafter, BHPB DEIS/DEIR) is inadequate. In the description of cumulative impacts, Page 4.20-14 notes, "The Project would increase maritime traffic in the area." As Page 4.2-27 of BHPB DEIS/DEIR notes, the potential frequency of vessel collisions involving a LNG carrier or other large container ships (in addition to commercial and recreational fishing vessels) was not estimated.

Due to the close proximity of the proposed project to nationally and internationally designated marine protected areas (e.g., the northern Channel Islands), the release of bunker or diesel fuel used in vessel transportation during a vessel accident, such as a collision, poses Class I impacts to coastal marine ecosystems of the study area.

For the greater northern Channel Islands marine region, the characterization of the risk in the BHPB DEIS/DEIR, given future vessel traffic in and around the project area, is inadequate. The floating storage and regasification unit (FSRU) mooring would be situated near the southbound Coastwise Traffic Lane. The BHPB DEIS/DEIR lacks a substantive analysis on potential cumulative effects on marine ecosystems and marine resource users from potential maritime accidents. Should an incident occur (e.g., LNG tanker collision) there will likely be Class I impacts to coastal marine ecosystems of the northern Southern California Bight, including the Channel Islands National Marine Sanctuary (CINMS) and Channel Islands National Park (CINP). G437-296

Without a more thorough and credible use of the best available scientific information in risk and environmental impact assessments, the BHPB DEIS/DEIR falls short of the required identification and evaluation of potential direct, indirect, and cumulative impacts on the natural environment that may result from, for example, increased vessel traffic (i.e., vessel collision or maritime accidents) within the project area.

G437-295
Section 4.7.4 contains an analysis of the potential effects from vessel accidents.

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Sections 4.7.4 and 4.20.3 discuss these topics.

In accordance with CEQA and NEPA, the cumulative impacts analysis should include an analysis of impacts of "reasonably foreseeable future projects". Page 4.3-1 characterizes the number of annual commercial vessel traffic in the area transiting the Coastwise TSS to and from the Port of Los Angeles/Long Beach (approximately 10,000 transits in total). Page 4.3-10 of the BHPB DEIS/DEIR estimates the number of LNG carriers as 104 to 156 annually. G437-296

In Section 4.20, the BHPB DEIS fails to consider and evaluate the cumulative impacts of the expansion of the Port of Los Angeles/Long Beach and resulting increased vessel traffic on the operation of the proposed project during its estimated 40-year life. Table 4.20-1 of the BHPB DEIS/DEIR does not include detail on the Port of Los Angeles/Long Beach expansion.

Vessel traffic in the project area will likely be greater than the BHPB DEIS/DEIR identifies and evaluates in terms of risk and cumulative impacts. As a consequence, the BHPB DEIS/DEIR undervalues the level of risk associated with a vessel collision and the impacts that such a collision may have on the coastal marine environment. Moreover, it is unclear whether the Independent Risk Assessment includes the expansion of the Port of Los Angeles/Long Beach in the analysis.

The current plan for the Port of Los Angeles/Long Beach is to increase capacity by 100% by the year 2020 [while the proposed project completion date is 2008]. Port expansion will dramatically increase the number of transits during the proposed project operation. It is crucial that this factor be considered, evaluated and assessed in terms of potential risk to public health and the marine ecosystems of the northern Southern California Bight.

The Port of Los Angeles/Long Beach is the busiest port of entry on the West Coast, and serves all of the Pacific Rim countries. Since 1990, containerized trade at the Port of Los Angeles/Long Beach has increased by 150% making it the third largest port in the world (behind Hong Kong and Singapore). The Port of Los Angeles/Long Beach is now constructing the largest harbor expansion project ever done in the United States. Today, the 26 miles of wooden wharves in Port of Los Angeles/Long Beach are being replaced with modern cement docks for containerized cargo, petroleum and chemical transshipment, open cargo loading facilities and, in addition, new recreational areas are being created. This information is readily available and should be included in the analysis.

The future capacity at the Port of Los Angeles/Long Beach will lead to larger vessels and container ships that carry more fuel and cargo. Fuel and cargo released during a maritime accident in the study area could significantly impact coastal marine ecosystems. Increased use of the Santa Barbara TSS is likely. Vessel traffic will increase and will occur in close proximity to OCS oil and gas platforms and structures, such as Platform Grace. Vessel traffic will also increase in a marine region that is used by the U.S. Department of Defense military operations, e.g., the SOCAL Range Complex. In the foreseeable future, larger container ships and vessels will carry more heavy bulk fuel (and

diesel fuel) during the operation of the proposed project to and from the Port of Los Angeles/Long Beach via the Santa Barbara TSS.

One real threat to coastal marine ecosystems is that large container ships, fast moving LNG carriers, and other large vessels can lose power, as in the current example of the double-hulled Selendang Ayu, a soybean freighter that is spilling heavy bulk and diesel fuel off of Analaska Island, Alaska. The risk of losing power within the Coastwise Traffic Lane, near Anacapa Island or Santa Barbara Island, near an OCS platform, should be assessed in the BHPB DEIS/DEIR. The impact of vessel collision or accident and the associated "oil spill" or other marine pollution on the marine ecosystems of the area will be significant (i.e., Class I impact). G437-297

There are several recent examples of significant ecological impact from vessel accidents:

- The Ecuadorean-registered tanker Jessica ran aground on January 16, 2001 in a bay on San Cristobal Island near the environmentally-sensitive Galapagos Islands, and began leaking oil on January 19, 2001. Over 600,000 liters of fuel seeped out the tanker. Ecuador's government said the damage from the oil spill was "extremely grave." Slicks affected a marine area over 303-square kilometers, and reached Espanola Island, home to large colonies of sea lions, and the island of Santa Fe, famed for the Santa Fe land iguana, a species found nowhere else. Local biologists say the long-term danger is that the fuel will sink to the ocean floor and destroy algae vital to the food chain, threatening marine iguanas, sharks and other species. Slicks have already reached some nearby beaches and harmed sea lions and birds, including blue-footed boobies, pelicans and albatrosses.

- In early December 2004, the 738-foot Malaysian-flagged vessel, the Selendang Ayu, lost power and began drifting in the Bering Sea, according to Coast Guard reports (Attachment I). Efforts to tow it and to anchor it failed because lines broke in the stormy weather. The ship was carrying 480,000 gallons of bunker fuel and 21,000 gallons of diesel fuel when it broke apart off an island's rocky coast. It is estimated that 140,000 gallons poured out because the breach in the ship opened one of the fuel tanks, officials said.

Given the proposed LNG carrier East-West traffic scheme, and the North-South vessel traffic for large container ships using the Port of Los Angeles/Long Beach, the threats posed by a vessel accident to the marine life of the region are under-estimated in the BHPB DEIS/DEIR. Santa Barbara and Anacapa Islands are particular concerns given the importance of these islands for bird reproduction. An "oil spill" and other vessel-related accidents in the project area will likely be difficult to contain. The "ecological core" of the Southern California Bight is the northern Channel Islands, which was designated as a national marine sanctuary in 1980. The Channel Islands National Marine Sanctuary (CINMS) encompasses 1252 square nautical miles of nearshore and offshore waters surrounding the islands of Santa Cruz, Santa Barbara, Anacapa, San Miguel and Santa Rosa. The CINMS includes forests of giant kelp, which are important nurseries for

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See response to Comment G437-291.

populations of fish and invertebrates. At least 27 species of whales and dolphins have been sighted in the CINMS and about 18 species are seen regularly and are considered "residents". The *largest* concentration of blue whales in the world can be found within the area. The CINMS lies on the migratory pathway of the California gray whale and other large baleen and toothed whales. San Miguel Island supports the most numerous and diverse avifauna in the CINMS, with nine species having established colonies.

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cont.

The project area for the proposed LNG terminal is part of a marine "ecotone" or transition area that combines warmer and colder-water oceanographic provinces. Within the Southern California Bight, the Santa Barbara Channel includes patterns of warm, saline water from the Southern California Countercurrent and the colder water from the California Current. The "mixing" of oceanographic currents produces one of the world's hot spots for coastal marine life; the marine area of the northern Channel Islands should be considered "the Galapagos of the eastern Pacific" due to the region's biodiversity. The prevailing countercurrent is an important factor that may contribute to the risk of a catastrophe of a vessel-related accident. For example, a LNG carrier or containership that loses power could be carried by the countercurrent into one of the northern Channel Islands.

The potential impacts of an "oil spill" or other vessel-related accident and catastrophe on the marine environment should be thoroughly re-evaluated and assessed. A vessel accident could have major long-term impacts on biological communities and ecosystem relationships, and would likely diminish the ecological importance of designated Marine Protected Areas (Allison et al. 2003). Allison et al. (2003) describe the risks associated with catastrophic events in the Santa Barbara Channel in relation to the CINMS's priority management goal of biodiversity protection and the recent designation of MPAs in State waters.

The study area is located along the Pacific Flyway, a major migratory route for birds, and the habitats of the area are a stopover during both north (April-May) and south (September-December) migrations. The habitats of the Southern California Bight (SCB) provide breeding, nesting, and feeding sites for many species and large numbers of seabirds, including many federally and state listed endangered and threatened species. Over 60 species of marine birds may be using sanctuary waters to varying degrees as nesting and feeding habitat, for wintering, and /or as migratory or staging areas. Of the 16 resident species of marine birds in the SCB, eleven breed in the CINMS. Santa Barbara Island has several nationally and internationally significant seabird nesting areas, including the largest nesting Xantus' murrelet colony and the only nesting site in the United States of black storm-petrels. The brown pelican, a listed endangered species, maintains its only permanent rookery in California on Anacapa Island, which is the closest island to the proposed LNG terminal.

Threats to Coastal Marine Ecosystem Health and Integrity

It appears as if the consultants to the proposed project are unfamiliar with the coastal and marine ecology of the study area. The BHPB DEIS/DEIR fails to include the Xantus's murrelet as a nesting bird on Anacapa Island. The consultants to the developer incorrectly cite a NOAA 2002 document on Marine Protected Areas (Page 4.1-19). The correct reference is CDFG 2002. Section 4.7 Biological Resources in the BHPB DEIS/DEIR fails to refer to important peer reviewed scientific literature on the general status of the marine ecosystems, and other technical reports, such as S. Polefka (2004). *Anthropogenic Noise and the Channel Islands National Marine Sanctuary: How Noise Affects Sanctuary Resources, and What We Can Do About I.* A report by the Environmental Defense Center (Santa Barbara, CA). Because of the species richness and unique habitats of this marine system, this marine area is designated by the United Nations (UN) as one of the world's biosphere reserves. This information is also not included in the environmental impact assessment. Anecdotal information that has not been peer reviewed is often cited and referred to in the section on marine mammals. Indeed, a significant amount of peer reviewed scientific literature on the study area is available, yet it is not reviewed in Section 4.7. These types of omissions or failures on the part of the consultants to the BHPB DEIS/DEIR undermine the credibility of the assessment. This is one of the most studied marine ecosystems in the world; the information is readily available and should be included in the analysis.

A major failure of the BHPB DEIS/DEIR is that project consultants do not describe the general character of the decline in coastal marine ecosystem health of the area in Section 4.7.1. This is surprising given recent focus on the plight of marine ecosystems at the federal level (U.S. Ocean Commission Report) and at the state level (e.g., the Governor's "Protecting Our Ocean: California's Action Strategy"). Section 4.7 provides an inventory of species identified in the study area. The uniqueness and fragile nature of the coastal marine ecosystem linkages and relationships are not described in the BHPB DEIS/DEIR. Important relationships and linkages that exist in the study area between coastal and marine species and habitats are described in McGinnis (2000).

The CDFG (2002), *Marine Protected Areas in NOAA's Channel Islands National Marine Sanctuary*, Volume I, Chapter 4, provides a much more thorough and credible identification and analysis of the environmental setting and the affected environment. Section 4.2.5.2 of the CDFG Final EIR provides an excellent summary of the existing status of marine ecosystem health. As described in CDFG (2002), scientific evidence indicates that the maintenance of marine ecosystem structure and patterns of native species diversity have dramatically changed in the Southern California Bight. Recent data from extracted cores from the Santa Barbara Channel includes high quality information that can be tracked in increments of close to 50 years. The cores show rapid and extreme shifts in water temperatures during the last 60,000 years. These shifts are known as "regime shifts" that influence the distribution and abundance of marine animals and plants of the Bight. This information is also described in the CINMS "Study Area Report" by McGinnis (2000), the National Park Service, *Gaviota National Seashore*

Feasibility Study (2003), and other government documents and technical reports. This material and information is not reviewed in the BHPB DEIS/DEIR.

In addition, the impacts to coastal ecosystems from the proposed project and operation should be considered within a framework that includes an understanding of the loss of coastal ecosystems of the south coast. California ranks second in the U.S. in the number of listed threatened and endangered species. A majority of these species depend on coastal wetlands during part of their life cycle. Notable examples of wetland types that largely have been eliminated in southern California include: estuarine wetlands (i.e., salt marshes) as an entire subsystem at 75-90%; "the riparian community" at 90-95% including loss of 40% of the riparian wetlands in San Diego County during the last decade alone; and vernal pools at 90%. This material and information is not reviewed in the BHPB DEIS/DEIR. G437-293

A general summary of the decline in coastal ecosystem health of the study area is depicted in Table 1 below (McGinnis 2000; CDFG 2002):

Table 1
Ecosystem Disturbance of the Southern California Bight (SCB)

- The Euphotic Zone (upper sunlight zone of the sea, less than 120 m thick): There has been a long-term deficit in the supply of food necessary to meet the metabolic demands of the sediment community. Despite this decline in food supply, the food demand of the deep-benthic sea community remained constant.
- Macrozooplankton: Since the late 1970s, macrozooplankton volume in the California Current has declined over 70%, in concert with increasing sea surface temperatures. Reduced macrozooplankton has a major impact at higher trophic levels by changing the nature of the food supply.
- Fishes and Invertebrates: There has been a decrease in harvest for most categories of groundfish, rockfish, California sea urchin landings, landings of swordfish and selected shark species, California halibut, among others. Many of these declines began in late 1970s.
- Oceanic Birds: Ecological theory predicts that in a stable ecosystem those species occupying high trophic levels maintain native species diversity and community structure. Upper trophic level animals such as pelagic birds are indicators of the health of the marine environment. Evidence suggests that the abundance of oceanic birds in the region and the SCB have declined steadily since 1988. Ocean warming and climatic events change pelagic bird abundance within the California current system.
- Southern California Kelp: Starting in the late 1970s, kelp forests have suffered great damage, and show a two-thirds reduction in standing biomass since 1957 in southern California kelp forests.
- Global Climate Change: There is also some indication that the frequency of these climatic events may be increasing, and will have significant impacts on coastal and marine systems.

This is important ecosystem-based information that is not included in the evaluation of cumulative impacts to the coastal marine ecosystems of the study area. Scientists have also shown the human use of the marine environment (e.g., overfishing and marine pollution) are the primary causes of general ecosystem decline. For example, Dr. Jeremy Jackson et al. (2001) describe the history of the collapse of kelp and other coastal marine ecosystems off southern California. "Overfishing and ecological extinction," according to Jackson et al. (2001), "predate and precondition modern ecological investigations and the collapse of marine ecosystems in recent times, raising the possibility that many more marine ecosystems may be vulnerable to collapse in the near future".

Given the cumulative and current levels of resource over-use in the area, the proposed development should be characterized as a Class I impact to the coastal marine ecosystem and associated biodiversity – a marine ecosystem that is currently showing signs of significant disturbance. Scientists have shown a decline in primary and secondary levels of ecological productivity in the marine area (McGowan et al. 1998). General marine impacts from the proposed development are described in Table 1.4-1. These impacts should be carefully evaluated within the context of a degraded marine ecosystem and in terms of cumulative impacts of the multiple-use of marine resources of the study area. G437-293

Given the project area's close proximity to major urban centers and the availability of important marine resources, the nature of multiple-use conflict (OCS oil and gas activity, commercial and recreational fishing, non-consumptive use, Department of Defense operations, among others) has not been carefully identified and evaluated in the BHPB DEIS/DEIR, despite the fact that this information is readily available. I would recommend that the developer review recent material on the affected environment of the study area by CINMS at http://channelislands.noaa.gov/manplan/documents.html. The BHPB DEIS/DEIR should include a more detailed characterization of the nature of marine resource use and multiple-use conflict. In addition, the proposed project will exacerbate existing and future multiple-use conflict of the area and should offer mitigation to address associated impacts.

Additional mitigation and specific details on emergency procedures for all phases of the proposed project (construction to operation) should be included in the BHPB DEIS/DEIR that address these issues described above.

The Threat of Marine Invasive Species

I now turn to a final comment concerning the threats posed by marine invasive species associated with the operation of the LNG terminal. The BHPB DEIS/DEIR describes the proposed Cabrillo Port operations and the existing regulatory setting for ballast water exchange. Ships arriving from outside the Exclusive Economic Zone (EEZ) in the East-West spatial dimension are now asked to conduct ballast water exchange in water greater than 200 nautical miles (370.4 km) from land and greater than 2,000 meters in depth according to International Maritime Organization guidelines. G437-294

However, the management approach adopted in the BHPB DEIS/DEIR will not prevent or control the introduction of marine invasive species to the study area. Marine invasive species pose a threat to nationally and internationally significant MPAs that are located around the northern Channel Islands (Attachment II). Appropriate mitigation measures should be included in the project to focus on prevention and control of marine invasive species. Preventative rather than reactive policy measures are necessary to control the spread of marine invasive species due to the extremely difficult nature of locating and eradicating these invasives and the uncertainty of their impacts on ecosystems (Ruiz and Carlton 2003 among others).

Commercial shipping is the primary vector for introductions of marine invasive species. The problem of marine invasive species have been identified by scientists and policymakers as a major threat to marine biodiversity and have resulted in hundreds of millions of U.S. dollars in direct costs and losses of ecosystem services during the last century. Invasive species are the second leading cause of biodiversity loss worldwide. Marine invasive species pose potential impacts on human health, marine ecosystem health, and may impact the economic production of resources from marine systems.

The General Accounting Office (2002) and the U.S. Commission on Ocean Policy (2004) note that the primary reason for the problems caused by marine invasive species is incomplete unilateral action for a transboundary pollution problem. An example of unilateral action is California policy that requires mandatory reporting of ballast water exchange or other methods to treat ballast water outside of the EEZ for vessels arriving to the state. [Not all ships, however, discharge ballast water outside of the EEZ. Approximately 50% of the vessels discharging ballast upon arrival to California ports during the first six months of 2000 were from Japan, China and Korea. However, 50% of shipping traffic to California takes place *within* 200 miles of the coastal mainland, primarily from vessel traffic between Mexico and Canada. These vessels are not subject to any guidelines for ballast water or biofouling.] There are also known limitations to ballast water exchange as new introductions have not been abated.

The study area for the proposed BHPB is a particular concern regarding the potential introduction of marine invasive species. Scholars have found that the rapid increase in the rate of invasive species introductions corresponds with the significant increase in shipping traffic along coastal California. Current national and international policies are ineffective in preventing new marine invasions and also in dealing with identified introductions once they have occurred. The U. S. Commission on Ocean Policy (2004) reaffirmed this position by stating, "Invasive species policies are not keeping pace with the problem primarily because of inadequate funding, a lack of coordination among federal agencies, redundant programs, and outdated technologies".

It is widely recognized that the first and foremost line of defense for combating the potentially damaging effects of marine invasive species is to prevent introductions. This position was recently supported by the U. S. Commission on Ocean Policy (2004): "Recognizing the economic and biological harm caused by invasive species, and

acknowledging the difficulty of eradicating a species once it is established, aggressive steps should be taken to prevent such introductions". Preventing introductions requires vector management. As pointed out by Ruiz and Carlton (2003), preventing marine invasive species introductions is a recognized priority in policy development and preventive measures are being taken in various ways throughout the United States and the world. Actions focusing on preventing introduction through vector management have the advantage of focusing on the mechanism of introduction and being applicable to multiple species.

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With regard to marine invasions, the BHPB DEIS/DEIR focuses on ballast water as a vector for introducing marine invasive species. Open ocean exchange is designed to reduce the abundances of coastal organisms, which have the greatest probability of being able to survive in the non-native waters of distant ports, by replacing them with open ocean species. There is considerable evidence, however, that compliance with open ocean exchange of ballast water is not high. To reduce the likelihood of introductions, more attention needs to be given to other vectors, including ship fouling (e.g., hulls, anchor chains, and ship surfaces).

Biofouling of invasive species on boat hulls has not been properly accounted for in the BHPB DEIS/DEIR.

Given the nature of the proposed project, it is important that Australia and the U.S. (and California) encourage a comprehensive and coordinated proactive strategy to prevent the spread of marine invasive species. The International Maritime Organization (IMO) has developed a number of recommendations. These recommendations focus on the incentives to individual countries and regional trading blocs to stimulate actual adoption of the international standards. Joint protection (such as programs that support general surveillance and eradication of marine invasives) should be considered in this project, and should be developed as important mitigation measures.

Alternative options to ballast water exchange include techniques that mechanically, physically, chemically or biologically kill or remove the unwanted invasive species. Alternatives include: 1) heat in-transit practices, 2) ultra violet treatment, 3) filtration, 4) ozonation, and 5) deoxygenation. These alternatives to ballast water exchange may overcome the spatial limitations and incomplete effectiveness of exchange in cases involving coastal traffic.

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Australia has moved beyond ballast water to address pre-border and post-border control systems for a variety of vectors. Their national plan includes monitoring activities to distinguish between new incursions or the spread of existing marine invasive species, emergency response including interagency coordination, and cost-sharing arrangements. A similar management approach is warranted for the proposed project.

In addition, a common theme in recommendations concerning effective control of marine invasive species is the development of effective field monitoring programs. Field

programs are needed for early detection, to track the rate of spread of invaders, and to determine their ecological impacts. Effective monitoring programs also can provide data for evaluating the efficacy of vector interdiction or other control programs. An effective, bi-national field monitoring program (Australia and the U.S.) should be developed in conjunction with the proposed project to address introductions of invasives. Such a program should be highly coordinated, implemented across a network of sites, and include robust, standardized measures of species composition, distributions, and abundances over time.

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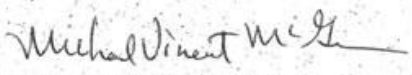
Thank you for the opportunity to comment on the BHPB DEIS/DEIR.

Sincerely,



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References cited

Allison, G.W. et al. (2003) Measuring persistence of marine reserves: catastrophes require adopting an insurance factor. *Ecological Applications Supplement* 13(1): 8-24.

California Department of Fish and Game [CDFG] (2002). Marine Protected Areas in NOAA's Channel Islands National Marine Sanctuary. Final Environmental Document. Volume I and II. Sacramento, California.
http://www.dfg.ca.gov/mrd/ci_ceqa/pdfs/cover_vol1.pdf

Jackson J. et al. (2001) Historical overfishing and the recent collapse of coastal ecosystems. *Science* 2001; 293: 629-637.

General Accounting Office (GAO) (2002) *Invasive Species Clearer Focus and Greater Commitment Needed to Effectively Manage the Problem*. GAO Report No. GA)-03-1, Wash. D.C.

McGinnis M.V. (2000) *A Recommended Study Area for the CINMS Management Planning Process: Ecological Linkages in the Marine Ecology from Point Sal to Point Mugu, including the Marine Sanctuary*. Prepared for the Channel Islands National Marine Sanctuary. National Oceanic Atmospheric Administration. US Department of Commerce. January. http://www.cinms.nos.noaa.gov/manplan/pdf/McGinnis.pdf

McGowan J.A., D.R. Cayan, and L.M. Dorman. (1998) Climate-ocean variability and ecosystem response in the Northeast Pacific. *Science* 281 (5374):210-217.

National Park Service. *Gaviota Coast Feasibility Study*. (2003) U.S Department of Interior. 2003. http://www.nps.gov/pwro/gaviota/

Ruiz, G. and J. Carlton (2003) *Invasive Species Vectors and Management Strategies*, Island Press, Wash. D.C.

U.S. Commission on Ocean Policy. (2004) *An Ocean Blueprint for the 21st Century*. Washington, D.C. September 20.
http://oceancommission.gov/documents/prepub_report/welcome.html#final

Dramatic rescue of ship attempted in brutal seas, December 11, 2004
By ERIC NALDER, SEATTLE POST-INTELLIGENCER INVESTIGATIVE REPORTER

"Thick fuel oil is spreading toward a marine sanctuary".

The attempt to rescue the Selendang Ayu has implications in Washington state. For years, a local environmentalist, Fred Felleman, has been fighting first to post a tractor tug at the entrance to the Strait of Juan de Fuca at Neah Bay and now to keep it there. The tug would keep ships like the Selendang Ayu from going aground and spilling oil on a nearby marine sanctuary.

Currently, there is a powerful Foss tug at Neah Bay with all the right equipment to tackle a ship the size of the 738-foot Selendang Ayu, according to officials at Foss. But a smaller tug, with less power, is usually posted there.

"This really underscores the need to have the appropriate sized tug, and with the appropriate equipment on board, at Neah Bay," said Felleman.

Felleman said a kit with towing equipment would be "better than a poke in the eye" but not good enough. He wants tugs posted year-round at critical locations to protect marine sanctuaries."

When he arrived at the hellish scene where seas as tall as a three-story building were battering the bulk carrier Selendang Ayu, tug captain Rob Campbell knew he had only a slim chance to help keep the disabled freighter from going aground on a rocky beach.

It was 4 a.m., and the winds pushing the ship were screaming at more than 60 miles per hour.

Another tug, the Sidney Foss, had a steel line attached to the stricken ship's bow, but it could pull only so hard without tipping itself over. Ten hours of pulling -- with 3,000 horsepower -- had slowed the ship's steady drift to shore from only about 4 knots to 2 knots.

Campbell, 51, could see the Selendang Ayu was in the most dangerous position possible. It was stuck in the trough of the heavy seas, sideways to the pounding 35-foot waves -- a death sentence.

His tug, the James Dunlap, had only one way to help. It had to get another line attached to the ship's bow so the vessel could be pulled around to face the waves.

Then, and only then, might the freighter be pulled away from the rocks.

But Campbell didn't have the right equipment. He had no line gun to fire a messenger rope onto the stricken ship. A messenger line allows a thicker cable to be drawn aboard

the ship, so the tug can be lashed to the vessel for pulling.

For years, Campbell said, he's been urging the Coast Guard to purchase a kit containing a line gun, plus some strong but lightweight towing rope and a special hook that can capture a ship's anchor. The kit, which he estimates would cost $50,000, could be stored in Dutch Harbor so that any tug that was sent to rescue a vessel could use it.

The James Dunlap is a 100-foot, 4,300-horsepower tractor tug with a propeller fitted in a nozzle that can be turned in any direction. That gives it the ability to pull powerfully in any direction.

But it's a harbor tug, equipped to guide container ships into their docks, not a rescue tug equipped to salvage ships.

"Nobody wants to pay for all this, but if you really want to make sure these things don't happen ... pay me now or pay me later," Campbell said. "For years, I've been suggesting every time we have one of these meetings that we have some emergency tow gear set up in place in Dutch Harbor. We are a work-boat, not a salvage boat. Every time we do these kinds of things, we have to make do with what we can put together."

Capt. Jack Davin, chief of the Coast Guard's marine safety office in Alaska, said he'd prefer if all tugs would carry line guns and two cables, as the Sidney Foss did. But Coast Guard regulations don't require it, he said.

He said he hadn't heard about Campbell's suggestion but wouldn't reject it outright. He's skeptical, however.

"Normally the United States government doesn't buy equipment for use by private companies to make more money and do their job," he said.

Only three hours after the James Dunlap arrived on the scene, the steel cable the Sidney Foss was pulling on broke. That was around 7 a.m. Wednesday. Hours later, the ship ran aground and then broke in half. During an effort to rescue the crew, a Coast Guard helicopter crashed. The Coast Guard crew and one sailor from the freighter were rescued, but six of the Selendang Ayu's crew are missing. Thick fuel oil is spreading toward a marine sanctuary.

The attempt to rescue the Selendang Ayu has implications in Washington state. For years, a local environmentalist, Fred Felleman, has been fighting first to post a tractor tug at the entrance to the Strait of Juan de Fuca at Neah Bay and now to keep it there. The tug would keep ships like the Selendang Ayu from going aground and spilling oil on a nearby marine sanctuary.

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"This really underscores the need to have the appropriate sized tug, and with the appropriate equipment on board, at Neah Bay," said Felleman.

Felleman said a kit with towing equipment would be "better than a poke in the eye" but not good enough. He wants tugs posted year-round at critical locations to protect marine sanctuaries.

Though the efforts of the Sidney Foss and the James Dunlap failed, they were not without heroics.

The Coast Guard learned that the Selendang Ayu was drifting without power at around 3:30 a.m. Tuesday. A Coast Guard cutter, the Alex Haley, was diverted from patrol in the North Pacific at 5 a.m., said Coast Guard Chief Petty Officer Darrell Wilson. It had a line gun, but Wilson wasn't sure whether the cutter helped in any effort to tow the vessel.

Sending tugs to save the ship took a bit longer. The Sidney Foss left Dutch Harbor around 10 a.m. and the James Dunlap headed out at around 7:30 p.m. Campbell said the fact the Selendang Ayu was a foreign ship created delays in sending out tugs. He said officials had to determine who was responsible for paying for the salvage. If it had been a U.S.-flagged ship, Campbell said, the dispatch might have been quicker.

The Sidney Foss is an oceangoing tug, about 125 feet long, and its normal job is to tow cargo barges to Adak. It is the only vessel that does so. Called into emergency service, the Foss tug dropped off its barge and headed for the Selendang Ayu, arriving at 8:30 p.m.

Luckily, the Sidney Foss has a line gun, which it carries for emergencies like this, said Doug Pearson, manager of marine transportation for Foss Maritime in Seattle.

But conditions were horrible. The Sidney Foss crew had to work from the tug's second deck because the tug's main deck was buried in roiling seas. Twenty- to 25-foot waves pitched the vessel as it approached the Selendang Ayu.

A lucky shot from the line gun -- which is big, like an elephant gun -- carried a messenger line to the stricken ship on the first try, Pearson said. A thicker line was dragged aboard the freighter, and then a steel cable. That was the end of their luck.

Though the cable was attached to the bow, the Sidney Foss could not pull the ship around to face the increasingly punishing seas.

Tug Capt. Bob Farrell and his crew of five were hoping for "enough time to get out of the darkness, at least get daylight," said Pearson. "We pulled on the ship as hard as we could safely for the crew and the tug, without putting them in jeopardy," said Steve Scalzo, president of Foss Maritime.

The James Dunlap was bucking heavy seas just to get to the scene. "We were getting hammered, we got abused, beat up, on the way out there," said chief mate Steve Devitt. The tug had left Dutch Harbor with only the captain and two crewmembers. Normally, they would have five.

Arriving at 4 a.m., Campbell couldn't get his tug closer than 600 feet from the ship, and even that close was dangerous. It was dark, with howling winds, and the seas were so huge they were threatening the James Dunlap at both the high and low end. In the trough of a wave, the James Dunlap was threatened with slamming its hull into the bottom. At the top of the wave, it might be tossed onto the deck of the Selendang Ayu.

"If you get up on top of one of those swells, it could throw you onto the ship," said Scott Manley, port captain for James Dunlap Towing Co., the La Conner, Wash., firm that owns the tug.

Other dangers included being sucked under the ship or forced around it toward the beach.

Without a line gun, he said he had no chance to lash up to the ship. Even if he had a line gun, in those conditions, he would have had only a limited number of tugs to try to turn the ship into the seas before his line, too, would have broken.

"At 7:30 the mate told me they (the Sidney Foss) parted their tow wire," recalled Campbell. "The rest was history."

The salvage vessel Reedemer was also on the scene, but its role was unclear. The Sidney Foss crew recovered its cable and prepared for another try at lashing to the ship, but to no avail. The James Dunlap -- named after the father of tug company owner Jim Dunlap -- was only able to stand its ground in the heavy seas and could render no assistance.

At one point, Campbell hoped to rescue crewmembers from the deck of the Selendang Ayu, but that, too, was impossible. He said he was "aghast" when he heard the ship's captain say over the radio that he had only three survivor suits for 26 crewmembers.

Davin, of the Coast Guard, confirmed there were only three survival suits aboard. He said he and other Coast Guard officials were surprised, but they found that three suits are all that is required under international treaty. He said it is too early to tell whether the lack of survival suits contributed to crewmembers' deaths, but it is possible.